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Morelli, Carlo J.

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The Illusions, Reality and Implications of British Government Expenditure 1948- 1968

Carlo J. Morelli

Department of Economic Studies,
University of Dundee,
Dundee.
DD1 4HN

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CARLO MORELLI

Abstract

This article presents unique industry level data on the level of government purchases from private industry. Utilising input-output data for the years 1948, 1963 and 1968 the paper highlights the importance of government as a consumer for private firms. Government as a consumer is shown to have been most significant for industries that also had high levels of industrial concentration and exports. The article provides an explanation for the government business relationship which is at odds with the bargaining environment approach. The article concludes that the government business relationship from the end of the Second World War onwards was contextualised by co-operation and integration rather than bargaining.

The illusions, reality, and implications of British government expenditure 1948-1968[1]

CARLO MORELLI

Government and its impact upon economic growth has always played a major role in explanations of British economic development.[2] The extension of government's influence on the private economy in the twentieth century has ensured government lies at the heart of explanations of relative economic decline. From highly influential popular writers including Barnett and Hutton to more serious academic studies including Broadberry and Crafts, Cairncross, Middleton, Phelps-Brown and Tomlinson the role of British government policy and expenditure continues to play an important yet disputed part in these debates.[3]

One of the central assumptions within much of this literature is that public expenditure is independent of, and exogenous to, the growth of the private sector. The British state has been portrayed as diverting scarce resources into non-economic activities and, or, incapable of developing the modernising incentive structures capable of halting relative economic decline.[4] Indeed the most important recent study of government expenditure takes as its title '*Government versus the market'* thus counterposing of non-market hierarchies and markets as methods of organisation. In contrast this article aims to demonstrate the growing integration and inter-dependence between government and business.

Using officially published *National Income and Expenditure Tables* section two reviews the growth of public expenditure while section three presents new data based upon early input-output studies, covering the years from 1948 to 1968, to

examine the sectoral importance of government as a consumer for private industry. The data presents evidence that total public expenditure (combined government authorities and public corporations) provided core markets for firms across a wide and diversifying set of private industries within the economy. The importance of this growing integration between government and British private industry is then examined in section four within the context of debates over the under-performance of the post war British economy. It is suggested that the emergence of a state capitalist merging of interests between public and private sectors is ignored by both the over-profligate welfare state and ineffective developmental state emphases currently underpinning much of the bargaining literature. Finally the article concludes that the economic history of postwar Britain can only be fully understood by integrating this increasing inter-dependence between public and private sectors within the historiography.

II

While the growth of total public expenditure as a proportion of total output has been well documented measurement problems create significant difficulties in interpreting the results.[5] Middleton's summary of this growth between 1937 and 1968 is reproduced in Table 1.

Table 1. Total Public Expenditure as a percentage of GDP at current market prices, by economic category

Economic Category	1937 %	1948 %	1951 %	1955 %	1960 %	1964 %	1968 %
Current goods and services	11.7	15.0	16.8	16.6	16.3	16.4	17.8
Gross capital formation	3.3	5.7	6.9	7.6	7.3	9.0	10.8
Current grants to personal sector	5.0	6.0	5.4	5.8	6.5	7.2	8.5
Subsidies	0.6	4.9	3.2	1.8	1.9	1.6	2.1

Current grants paid abroad	0.1	0.3	0.5	0.4	0.4	0.5	0.4
Debt interest	5.4	5.1	4.7	4.8	4.6	4.2	4.4
Total	26.0	37.0	37.5	37.0	37.1	38.9	43.9

Source: Middleton, *Government*, tab. 3.2.

The degree to which government has apparently grown may simply be due two forms of measurement error. As the service sector has grown, especially with the increase in non-traded services in advanced economies, it has been recognised that measurements of GNP have become 'more and more problematical' due to the difficulty of assigning market prices to services.[6] Second, government expenditure itself is exacerbated by the impact of relative price effects. Purchases, particularly within the defence and high technology sectors, where greater uncertainty exists in research and development are prone to more rapid price inflation than marketed goods while government services, particularly within welfare provision, typically involve high labour costs relative to total costs leaving limited opportunity for productivity growth.[7] As a result while government expenditure on goods and services may have increased by 910% between 1962 and 1981 at current prices when measured in constant prices the increase is reduced to 33%. Heald suggests that the only 'safe' conclusion to draw is that it has been price inflation rather than an increase in volume that has been the dominant influence in rising public expenditure.[8]

Although Table 1 highlights a relative stability in total public expenditure in the period from 1948-64 it also demonstrates a redistribution of expenditure towards gross capital formation and current goods and services after 1948. Expenditure leading to increases in gross capital formation was dominated by local government expenditure, accounting for as much as 90 per cent of expenditure in 1954 but more typically around three-quarters of expenditure in the 1950s. Expenditure on current goods and

services was concentrated within central government, typically accounting for around three-quarters of this expenditure throughout the 1950s.[9] The importance of the growth of these two areas, as will be seen below, was the creation of large centralised markets for private industry.

Further functional classification of public expenditure has been made by Middleton and is reproduced in Table 2. The provision of social services had been, and continued to be, the single most important outlet for public expenditure growing from 40 per cent to 46 per cent of total public expenditure between 1937 and 1968. However, this expenditure was not, as is usually implied, wholly transfer payments. Instead, spending on social services contained a significant level of expenditure on goods and services as well as capital formation, both of which involved private industry. By examining data for 1958, a year when the *National Income and Expenditure Tables* were reconciled with the *Census of Production*, and are believed to be at their most accurate,[10] we can see that 68 per cent of expenditure on housing was unrelated to wages and salaries, subsidies, grants or changes to values of stocks. In health and in education the comparable figures are 53 per cent and 34 per cent respectively.[11] Unfortunately, *National Income and Expenditure Tables* are unable to provide further detail on this expenditure. Interestingly, Table 2 also provides further information on expenditure beyond social services. Outside of debt interest payments, the most important areas for public expenditure are economic services and defence.

The most significant elements of expenditure within economic services are those related to agriculture, forestry and fishing, transport and communication, and other industry and trade, including civil nuclear energy.[12] Subsidies to agriculture, amounting to £272 million in 1958, accounting for over 83 per cent of government

expenditure on agriculture and food, was the most significant element of expenditure on economic services.[13] The importance of subsidies for the continuation of the agricultural industry at this time should not be overlooked. In 1947 the Lucas Report questioned the use of price capping and subsidies as a mechanism for maximising farm output. In 1948 this led to a limit being placed upon farm subsidies of £465m.[14] A decade later, despite subsidies falling in real terms, the Treasury maintained that Britain had the most highly protected agricultural industry in Europe with subsidies amounting to '50% of gross agricultural product, or rather value added'.[15] Elsewhere some 89 per cent of expenditure on transport and communications and 59 per cent of expenditure on other industry and trade was used outside of wages and salaries, subsidies, grants or changes to values of stocks.[16]

Table 2. Final Public Expenditure 1937-68 as a percentage of GDP, by functional classification.

Functional Category	1937 %	1948 %	1951 %	1955 %	1960 %	1964 %	1968 %
Social services	10.5	17.6	14.1	13.9	15.1	16.5	20.2
Debt interest	5.4	5.1	4.7	4.8	4.6	4.2	4.4
Defence	4.9	6.3	7.6	8.0	6.3	6.1	5.6
Economic services	2.7	4.8	7.1	6.2	6.9	7.1	7.8
Public administration	1.0	1.2	1.2	1.0	1.0	0.9	0.9
Law and order	0.5	0.5	0.6	0.7	0.7	0.8	0.9
External services	0.0	0.2	0.6	0.4	0.5	0.8	0.7
Environmental services	0.9	1.3	1.7	1.9	1.9	2.5	3.4
Total	26.0	37.0	37.5	37.0	37.1	38.9	43.9

Source: Middleton, *Government*, tab. 3.2.

It is clear that our understanding of government expenditure requires an investigation beyond the aggregate data. Whether it was in the provision of social

services or economic services, the growth of public expenditure cannot simply be discussed in a context of the growth of transfer payments, their distributional impact, or the incentive effects of marginal taxation rates. Neither can government expenditure on current goods and services be simply understood as government acting as 'employer of last resort'.[17] Instead public expenditure, even in the provision of welfare, represented the largest single market for private industry. Under these circumstances private industry required close collaboration with national and local government, nationalised industries and the plethora of purchasing departments.

The most commonly recognised area in which private and public interest merged was in defence expenditure. Of the major western economies only the United States spent more on defence (as a proportion of GDP) than Britain after 1945.[18] Although defence expenditure in Britain peaked in 1952, following the outbreak of the Korean War, and declined continually in real terms throughout the 1950s and 1960s Britain remained a high spending nation. While there is again no consensus over the impact on economic growth of high defence expenditure, a pessimistic view remains strong. Defence expenditure shifted research and development investment and science graduates towards capital intensive, military related technologies, with little opportunity for civilian spin-off.[19] In the process firms and whole industries saw the defence sector as their core market. By 1962, ten years after real defence expenditure peaked, military orders were estimated to account for at least 65 per cent, and probably 70 per cent, of the aircraft industry's output.[20] Within the electronics industry at least 22 per cent of total output was destined for military purposes. As much of this was concentrated within the industrial and radio communications sub-sectors, the proportion was likely to be at least 35 per cent of total production in these sub-

sectors.[21] In shipbuilding estimates of military orders suggest over 23 per cent of total output was accounted for by defence expenditure.[22] The close relationship between public expenditure and the growth of the defence sector has been a focus for Edgerton who has argued that the warfare-state dimension of the postwar settlement needs to be recognised. At its peak government was probably responsible for directly employing over one and a half million workers in the defence industry.[23] The postwar political consensus that emerged after 1945 was constructed around an industrial/military nexus based upon high technology and high defence expenditure.[24] This linkage between state and arms manufacturers was such that major arms contractors had become among the largest private firms in the country. As Edgerton notes 'nine out of the top fifty employers in 1955 were major defence contractors, each employing between 21,000 and 75,000 workers'.[25] Kidron and later Binns point to the importance of an international, permanent arms economy as a mechanism for introducing economic stability among the major world powers as an explanation for both the high growth rates and duration of the golden age.[26] Finally, Freeman maintains that government funding of research and development requires a 'considerable reorientation' away from military and prestige projects in order to establish a framework conducive to establishing more competitive industries.[27]

It has not previously been possible to quantify the degree to which the defence sector was representative of private industry's relationship to government as a whole. It is extremely difficult to ascertain the extent of non-military public expenditure on individual industries since the use of *National Income and Expenditure Tables*, as the primary source of data, prevents much further investigation into government expenditure. Fortunately, in the *Input-Output Tables for the United Kingdom* there is

another set of official publications which provides further industry level data on government expenditure.

III

Input-output tables derive from wartime governments' interests in economic management and the work of economists such as Leontief in the 1930s on the interdependence of industries within economies.[28] Input-output tables describe the flow of goods and services between industrial sectors within an economy and are based upon, and reconciled with, *Census of Production* and *National Accounts*.[29] The need to understand the impact of increases in output from individual sectors upon the economy as a whole, led to their use by the US military during the Second World War and their widespread use after 1945. Input-output tables were used as planning mechanisms during the reconstruction period in Norway, the Netherlands and Italy, and became still more widely used among developing nations following the spread of government inspired development programmes.[30]

Detailed input-output tables on Britain in the two decades after 1945 exist for the years 1948, 1954, 1963, and 1968.[31] The 1948 tables were published by researchers at the Department of Applied Economics, Cambridge in 1958 while those covering 1954, 1963, and 1968 were published by Central Statistical Office in 1961, 1970, and 1973 respectively.[32] The Input-Output tables for 1948 provide an industry x industry matrix dis-aggregated into 47 industry groups using the 1950 *Census of Production* categorisation, while the tables for 1963 provide dis-aggregated industry x industry data within 70 industry classifications using the 1963 *Census of Production* and the 1968 tables use a 90 industry classification based upon the 1968 *Census of Production*.[33]

By calculating the total purchases of intermediate products by the nationalised industries from each industry group and final product purchases by central and local government, and then measuring this against the total domestic sales of each industry, it is possible to ascertain how important public sector orders were on an industry by industry basis (see Appendix for methodology).

Tables 3, 4 & 5 highlight the diversity of public sector purchases across private industries for 1948, 1963, and 1968 while Table 6 provides a summary table of the importance of public expenditure (excluding capital expenditure) to a growing range of industries, accounting for at least 10 per cent of total domestic output.[34] This is consistent with the evidence from *National Income and Expenditure Tables* and indicates that government was increasingly becoming integrated into the whole of the British manufacturing sector as the period developed.

In the case of the aircraft industry, public sector orders were almost entirely responsible for the survival of the industry. By the late 1960s in heavy mechanical and high technology industries, including the shipbuilding, locomotive building, pharmaceutical, and other mining and quarrying (providing inputs into the gas industry) the public sector was absorbing half, or more, of all domestic output. These findings are consistent with our knowledge of the importance of military expenditure for the aircraft and shipbuilding industries and with the broad estimates made in 1949 by the Lemon Committee that around 30 per cent of engineering products not exported were purchased by the public sector.[35] Further support for these results can be found from Richardson, writing in 1969 on behalf of the British Electrical Manufacturers' Association, who points to the heavy electrical industry's virtual complete reliance upon nationalised industries for orders.[36] In pharmaceuticals the 1956 official government report into the National Health Service

stated that one-third of sales of the industry went to the National Health Service which Reekie suggests has remained consistent throughout the life of the NHS.[37] For other new technology industries, including radio and telecommunications and scientific instrument industries, the public sector accounted for as much as 40 per cent of domestic orders by the early 1960s. This again finds backing from Sciberras who notes of the semiconductor industry in the 1970s that the 'state and military markets still account for a substantial share of UK firms sales'.[38] For a wider range of industries outside of the heavy mechanical engineering sector, including the mineral oil (and manufactured fuels in 1968), wires and cables, rubber, small arms and general mechanical engineering industries, the public sector again represented a key market with around a fifth of total demand. Below this the public sector was a major market, responsible for over 10 per cent of domestic orders, across a diverse range of industries including chemicals (dyestuffs, explosives, polishes, and allied industries and soaps and detergents), precision and mechanical engineering (small tools, machine tools, industrial engines, and wire manufacturer), electrical engineering (domestic appliances, electrical machinery, and other electrical goods) paper and printing (printing and publishing, paper, board, and wood), and even household textiles.

Only within the electrical engineering and mineral oil sectors does there appear to be any consistent and significant decline in the importance of the public sector, suggesting that the public sector was of major importance prior to the emergence of large domestic markets for many electrical goods or oil based products.

Table 3 *Input-Output representation of Public Expenditure Purchasing from Private Industry in 1948*

	Coal	*Gas and Water*	*Electricity*	*Rail*	*Road*	*Public Authority*	*Total (ex. capital formation)*	*Total Domestic Output*	*Total Purchases as % of Domestic Output (excl. cap.formation)*[a]	*Public Sector Capital formation*	*Total Public Sector as % of Domestic Output inc. capital formation)*[a]
	£m	*£m*	*£m*	*£m*	*£m*	*£m*	*£m*	*£m*		*£m*	
Other mining & quarrying				1.0		0.1	1.1	90.5	1.2		
Drugs & perfumes						4.1	4.1	117.3	3.5		
Chemicals and co.	9.6	2.5	1		2.5	20.6	36.2	218.2	16.6		
Soaps and polishes				1		4.4	5.4	103.7	5.2		
Oils and greases	2.4	5.6	0.7	2.4	88.4	39.6	139.1	255.7	54.4		
Machine tools	10.3						10.3	105	9.8		
Mechanical engineering	0.3	0.1		7.2	6	13	26.6	419.5	6.3		
Electrical engineering	0.3	0.1	19.8	1	3.5	5	29.7	353.3	8.4		
Radio & telecommunications.		1	1.5	1.2	0.5	4.8	9	151.2	6.0		
Tools, wire and co.	1.5	1	1	3	0.3	11.5	18.3	215.2	8.5		
Hardware and hollowware	2.5	1.2	1	3	0.2	8.1	16	216.1	7.4		
Instruments and co.		0.1				14.6	14.7	121.3	12.1		
Other plant, mach. and metal goods [b]	19	6.9	1	0.3	0.1	3.1	30.4	1152.6	2.6		
Plant and Machinery							155	2603.2		137	11.2
Motor and cycles			0.3		68.5	15	83.8	340.9	24.6		
Aircraft						80	80	104.2	76.8		
Rail locomotives & rolling stock				19.5		2.8	22.3	128.6	17.3		
Shipbuilding & marine engineering						30	30	231.5	13.0		
Vehicles, ships and aircraft							216.1	805.2		55	33.7
Wood and cork	20.8	4.2	0.8	2.7	1.9	15.1	45.5	341.5	13.3		
Paper and board				2.5	1.1	6.6	10.2	201.5	5.1		
Printing & publishing				3.5	0.5	19	23	304.2	7.6		
Rubber		2	1	0.1	25	2.7	30.8	141.2	21.8		
Other manufacturing				0.2	0.1	6.0	6.3	204.9	3.1		
Building materials		0.9	0.2	0.7	0.1	19.2	21.1	203.0	10.5		
Building and Contracting	2	1	1	1	4.5	80	89.5	1158	7.7	478	49.0

Notes: [a] may not add due to rounding [b] Including, constructional engineering, iron and steel smelting, iron and steel, tin and tube making, non-ferrous metals and leather and fur.

Sources: Stewart, 'Input-Output', p.viii-ix: *National Income, 1955,* tab. 5.

Table 4 *Input-Output representation of Public Expenditure Purchases from Private Industry in 1963*

	Communication	*Coal*	*Gas*	*Electric*	*Water*	*Road and Rail*	*Public Authority*	*Total Purchases (excl.cap. formation)* £m	*Total Domestic Output* £m	*Total Purchases as % of Domestic Output (excl. cap.formation)* [a]	*Public Sector Cap. formation* £m	*Total Public Sector as a % of Domestic Output incl. fixed capital formation* [a]
	£m	£m	£m	£m	£m	£m	£m					
Other mining & quarrying	0.9	0.1	0.7		0.4		5.8	7.9	165.4	4. 8		
Coke ovens		0.2	2.5	0.8	0.1	0.1	8.1	10.8	175.3	6.2		
Mineral oil refining	1.4	1.9	19.7	19.6	0.8	41.3	19.1	103.8	406.8	25.5		
Pharmaceutical & toilet preps.		0.2		0.1		0.3	56.6	57.2	222.1	25.8		
Soaps, oils and fats		0.1				2.7	1.0	3.8	141.3	2.7		
Other chemical and allied ind.	0.1	5.5	1	1.5	1	6.1	64.1	79.3	772.5	10.3		
Machine tools		0.6	0.1	0.2	0.1	0.1	1.9	3	107.9	2.8		
Engineers' small tools		4	1.1	1.7	0.2	0.7	1.2	8.9	82.5	10.8		
Industrial engines		0.5	0.1	0.8	0.1	0.5	8	10	82.2	12.2		
Ordnance, small arms & general mechanical engineering		6.2	2.3	4.2	0.6	0.6	53.7	67.6	404.1	16.7		
Scientific instruments	0.2	0.3	0.2	0.3	0.1	0.9	54.4	56.4	156.8	36.0		
Electrical machinery	0.7	1.6	0.6	20.2	0.1	5.6	16.2	45	318.5	14.1		
Insulated wires & cables	1	8.6	0.1	25.1		0.8	10.3	45.9	182.1	25.2		
Radio and telecommunications	11.7	1.6	0.5	3	0.1	2.1	177.4	196.4	500.4	39.3		
Other electrical goods	1.5	2.2	0.4	6.5	0.2	21.2	19.6	51.6	361.3	14.3		
Other plant and machinery [b]		20.1	2.2	2.8	1.6	2.0	40.4	69.1	1054.3	6.6		
Other metal goods [c]	1.4	1.9	19.7	19.6	6.8	36.9	19.1	105.4	2669.5	4.0		
Plant and Machinery								659.4	5919.6		771	24.2
Shipbuilding & marine eng.		0.3	0.1	0.2		0.3	133	133.9	313	42.8		
Motor vehicles	0.7	2.5	0.4	1.4	0.2	26.8	42.4	74.4	950.7	7.8		
Aircraft		0.2	0.1	0.1		0.2	298.2	298.8	375	79.7		
Other vehicles		0.8	0.7	1	0.4	60.3	4.7	67.9	161.2	42.2		
Vehicles, ships and aircraft								575.0	1799.9		110	38.1
Paper and board		2.0	1.1	0.1		0.2	19.5	22.8	335.2	6.8		
Printing & publishing	9.5		1.3	0.1		8.5	55.1	74.5	713.2	10.5		
Rubber	0.5	6.2	0.2	0.5	0.1	45	5.0	57.5	285.8	20.1		
Other manufactures	0.7	10.9	0.2	1.1	0.4	5.8	21.0	40.1	349.3	11.5		
Building materials	0.5	7.4		3.3		0.5	1.3	13.0	404.6	3.2		
Construction	5	18	1.6	2.3	0.5	13	291	331.4	3231.1	10.3	1251	49.0

Notes: [a] may not add due to rounding: [b] Includes agricultural machinery, textile machinery, contractors' plant and equipment, office machinery, other non-electrical machinery and industrial plant & steel work: [c] Including Iron and steel, light metals, other non-ferrous metals, cans and metal boxes and other metal goods.

Sources: *Input-Output 1963,* tab. D: *National Income, 1969,* tab. 51 for gross fixed capital formation.

Table 5 *Input-Output representation of Public Expenditure Purchases from Private Industry in 1968.*

	Communication	*Coal*	*Gas*	*Electric*	*Water*	*Rail*	*Public Authority*	*Total Purchases (excl.cap. formation)* £m	*Total Domestic Output* £m	*Total Purchases as % of Domestic Output (excl. cap.formation)* [a]	*Public Sector Cap. formation* £m	*Total Public Sector as a % of Domestic Output incl. fixed capital formation* [a]
	£m	£m	£m	£m	£m	£m	£m					
Other mining and quarrying			14.0				6.5	20.5	39.6	51.8		
Coke ovens and manuf. fuel		0.1	10.9	0.9	0.1		18.3	30.3	224.5	13.5		
Mineral oil refining	1.1	2.6	52.8	35.9	0.3	7.4	31.0	131.1	721.1	18.2		
Pharmaceutical chemicals		0.1					118.	118.1	202.4	58.4		
Soap and detergents				0.3		3.5	12.4	16.2	136.4	11.9		
Other chemical industries		4.3				0.1	29.3	33.7	233.8	14.4		
Machine tools	0.1	0.6	0.1	0.3		0.1	2.6	3.8	162.0	2.3		
Industrial engines		1.		0.1	0.2	2.3	3.3	6.9	63.8	10.8		
Ordnance, small arms & m. eng		14.3		1.7	1.4	0.2	60.8	78.4	461.8	17.0		
Instruments engineering	0.4	0.3	1.3	0.6	0.1	0.2	50.5	53.4	303.5	17.6		
Electrical machinery	1.1	3.6	0.1	16.1	0.1	5.9	13.5	40.4	409.5	9.9		
Insulated wires & cables	36.6	6.3	0.2	31.		2.5	4.1	80.7	291.5	27.7		
Electronics & telecomms.	12.9	0.2	0.1	0.8		0.3	169.2	183.5	695.4	26.4		
Domestic electrical appliances	0.1	0.4	0.1	15.7		0.2	1.	17.5	231.8	7.6		
Other electrical goods	1.9		0.2	1.1	0.1	4.1	23.8	31.2	314.6	9.9		
Engineers' small tools	3.0	9.3	1.6	2.9	0.2		1.8	18.8	131.0	14.4		
Wire & wire manufacture	11.6	2.0		0.2		3.6	0.6	18.0	170.4	10.6		
Other plant and machinery [b]	0.7	17.2	5.0	8.5	2.6	1.8	46.1	81.9	1861.7	4.4		
Other metal goods [c]	3.0	44.2	25.2	3.6	7.1	13.8	14.3	107.8	3384.8	3.2		
Plant and Machinery								726.3	8482.1		1159	22.2
Shipbuilding & marine eng.							167.4	167.4	339.1	49.4		
Motor vehicles [d]	1.0	1.5	0.6	0.6	0.3	2.0	56.8	62.8	1210.4	5.1		
Aerospace							362.6	362.6	388.1	93.4		
Other vehicles		0.1				70.6	1.6	72.3	121.2	59.7		
Vehicles, ships and aircraft								665.1	2058.8		169	40.5
Household textiles							7.4	7.4	54.3	13.6		
Other paper & board	2.4	0.8		2.7	0.3	1.8	23.6	31.6	244.2	12.9		
Printing & Publishing	6.7	0.5	2.2	2.5	0.2	1.3	62.9	76.3	971.3	7.9		
Other manufacturing	0.6	0.2		0.4	0.1		27.7	29.0	221.7	13.1		
Building materials		1.0	0.3	4.6	2.0	6.5	20.5	34.9	448.2	7.8		
Construction	5.1	27.7	31.4	3.2	0.6	1.2	255.9	325.1	4922.5	6.6	2489	55.8

Notes: [a] may not add due to rounding: [b] Includes agricultural machinery, pumps, valves and compressors, textile machinery, construction and handling equipment, office machinery, other non-electrical machinery and industrial plant & steel work.[c] Includes bolts, nuts and screws, cans and metal boxes, iron castings, other iron and steel, aluminium and alloys, and other non-ferrous metals: [d] Includes wheeled tractors

Sources: *Input-Output 1968,* tab. D & P: *National Income, 1969,* tab. 51 for gross fixed capital formation.

Table 6. Government Current Expenditure Purchases from Private Manufacturing Industry as a Proportion of Domestic Output for 1948, 1963 and 1968.[a]

	1948	1963	1968
	%	%	%
Aircraft	77	80	93
Locomotives, railway equipment & other vehicles	17	42	60
Motors & cycles	25		
Shipbuilding & marine engineering	13	43	49
Pharmaceuticals [b]	10	26	58
Other mining and quarrying			52
Electronics and telecommunications [c]		39	26
Instrument engineering [d]	12	36	18
Mineral oil refining [e]	54	26	18
(Coke ovens & manufactured fuels)			(14)
Insulated wires & cables		25	28
Rubber	22	20	
Ordnance, small arms, general mechanical engineering & other mechanical engineering		17	17
Chemicals, lubricating oils, dyestuffs, explosives, polishes & allied industries [f]	17	10	14
Engineers small tools		11	14
Household textiles and handkerchiefs			14
Other manufacturing		11	13
Wood & cork [g]	13		13
Industrial engines		12	11
Domestic appliances		14	10
(Other electrical goods)			(10)
Electrical machinery		14	10
Soaps and detergents			12
Printing & publishing		11	
Wire and wire manufacture			11
Construction materials		10	
Machine tools	10		

[a] *Notes:* Figures show only industries where sales exceed 10 per cent of gross domestic output.

[b] Pharmaceuticals & toilet preparations in 1963

[c] Radio & telecommunications in 1963

[d] Scientific instruments in 1963

[e] Oils & greases in 1948

[f] Other chemical industries in 1968

[g] Other paper & board in 1968

Sources: Stewart, 'Input-output', pp.vii-ix; *Input-output, 1963*, tabs. A & D; *Input-output, 1968*, tabs. D & P.

Before we can assess the importance of these findings for our understanding of the wider economic history of postwar Britain we need to answer two further questions. First, to what extent can these results be considered to be accurate? Second, how much of the apparent spread of public sector expenditure across a widening group of industries is simply a product of the increasing complexity of the *Census of Production* categorisation?

As documented above, the secondary sources available, although often only giving broad estimates, do appear to correspond with the results from input-output tables. The tables above, therefore, represent the most accurate and detailed industry level results available to date. More importantly the significance of government as a market for individual industrial sectors reported in Table 6 are almost certainly minimum levels of importance due to the ignoring of expenditure leading to increases in gross domestic capital formation. Finally, there will be a further tendency for the increase of government's importance to be under-estimated due to the treatment of imports in the 1948 tables and exclusion of some areas of public expenditure from the estimates (see Appendix).

However, one question arising, particularly from Table 6 is whether or not the increasing number of industries reported is simply a product of greater differentiation within the industrial classifications. Table 7 makes clear that the increase of government orders lies not in changes in the classifications used by the C*ensus of Production* but in the genuine growth of public sector's importance across an increasing number of industries during the 1950s and 1960s. In particular, the growth of government's importance lay within the plant and machinery and the vehicles, ships and aircraft sectors of the economy.

Table 7. Public Sector Orders as a Percentage of Total Domestic Output 1948-68.

	1948 %	1963 %	1968 %
Plant and Machinery	11.2	24.2	22.2
Vehicles, Ships and Aircraft	33.7	38.1	40.5
Construction	49.0	49.0	55.8

Sources: Stewart, 'Input-output', pp.vii-ix; *Input-output, 1963*, tabs. 9, A & D; *Input-output, 1968*, tabs. D & P *National Income*, 1955, tab. 51 and, 1969, tab. 52

IV

That the British government was responsible for half of all construction over two decades is relatively well known. The postwar house building programmes followed by large-scale motorway construction projects ensured governments' role in the construction industry would be significant.[39] In contrast however the level of government involvement in manufacturing is neither less well known nor accepted and requires discussion.

Government expenditure has typically been understood in two ways. Neo-classically influenced writers have understood government expenditure as distorting market signals and crowding-out investment opportunities within the market sector. The provision of free goods and services is said to increase X-inefficiency since consumption will occur despite marginal benefit being lower than marginal cost, leading to allocative inefficiency.[40] Nowhere has this been more clearly expressed than in the two-sector model described by Bacon & Eltis. For Bacon and Eltis non-market expenditure represents unproductive expenditure in non-traded sectors and extracts scarce resources out of a productive, traded sector.[41] This view implies that unless outputs from public expenditure are sold in the marketplace public expenditure represents a drain upon an economy's limited resources.[42] As Bacon and Eltis explain it is 'the public sector activities which do not

provide marketed outputs that put particular pressure on the resources of the remainder of the economy'.[43] In their view growing public expenditure creates a crisis in which private investment is crowded out by an ever-increasing public sector. In reality Bacon & Eltis not only overstate the scale of the government sector but also fail to recognise the degree to which government activity in the provision of public goods acts to reduce market failure.

It is precisely in the area of government expenditure reducing the potential for market failure and hence encouraging allocative efficiency that the challenge to neo-classical ideas has been rooted.[44] Where externalities are derived from consumption, market mechanisms will lead to under provision. Individual marginal benefit will equate to individual marginal cost at an equilibrium below the equilibrium achieved for social benefit equating to social cost. Under these circumstances it is only through the provision of public goods that an optimal outcome and allocative efficiency at an aggregate level will be achieved.[45] Our understanding of postwar government expenditure has developed within this framework relating to debates over the importance and effectiveness of Keynesian macroeconomic demand management acting to reduce market failure. Keynes explanation for persistent interwar unemployment centred on the view that in the absence of a proactive government policy a stable equilibrium could emerge at a level below full employment. Through employment generating public works programmes, multiplier effects could increase aggregate demand to a new and higher stable level.[46] Thus the relationship between government expenditure and private industry was established through an indirect multiplier effect.

Assessments of the impact of Keynesian approach have been mixed. Cairncross emphasises the constraints under which government operated and apologetically suggests that 'it is not unreasonable to conclude that the influence of government policy on the underlying rate of growth in an industrial economy is of less consequence than is popularly supposed'.[47] Matthews in explaining the existence of full-employment has questioned whether governments actually utilised Keynesian ideas of monetary injections and multiplier effects to raise aggregate demand at all.[48]

While rejecting the Bacon and Eltis model other neo-classically influenced rational choice views have focused upon the distorting price signals created by the growth of government expenditure. An implicit postwar 'social contract' between labour, government, and employers in which a commitment to high welfare expenditure acting as a quid-pro-quo for government's minimalist approach to competition policy within the private sector reduced competitive pressures.[49] Thus Broadberry and Crafts, while accepting the short-term benefits of the postwar consensus, maintain that the 'postwar settlement and gradualist approach to the transition from war to peace had costs in terms of forgone productivity'.[50] The long-term result, in the British case, was an institutionalisation of weak incentive structures reducing the adoption of important changes required for more rapid productivity growth.[51] Further, in the absence of mechanisms for the destruction of institutional limitations, upon growth, sub-optimal choices that increase X-inefficiency could nevertheless appear rational. Eichengreen maintains that under such circumstances market failure occurs due to co-ordination problems with actors unable to establish markets to satisfy either latent demand or supply. One example is the, apparent, failure to develop managerial capitalism due to firms' inability to gain access to capital for

investment, caused by imperfect capital markets. This in turn was a product of the continuing strength of family firms preventing the emergence of sophisticated capital markets.[52] A damaging circularity became established in which distributional coalitions and cosy postwar deals restricted possibilities of growth and instead produced economic sclerosis.[53] Finally, while this view accepts that the growth of government expenditure 'alone' was not to blame, a willingness to replace market with non-market relationships ensured that the costs involved in government intervention, through the continuation of rent-seeking activity by distributional coalitions, remained hidden from consumers.[54]

Within this bargaining environment framework, accounts more sympathetic to the growth of government emphasise government's response to market failure and pragmatic responses to the impact of the Second World War. The limited success of rationalisation plans during the interwar period, with the coal industry being the primary example, and a lack of investment though the war, made nationalisation almost inevitable.[55] Within the network industries, government intervention led to a 'national unified framework with a public purpose' which prevented abuse of power within natural monopolies.[56] Government has still been criticised but now it is either too weakly interventionist or unable to overcome private sector opposition.[57] Thus Chick notes that the government faced 'strong local opposition which could not be cajoled into submission' when it attempted to rationalise the private steel industry before nationalisation in 1951.[58] Similarly, in their explanation of a low productivity consensus, Booth, Melling, and Dartmann have maintained that a failure to create a 'productivity coalition' after 1945 derived from an inability of the British state to develop proactive policies.[59] While Britain, arguably, was best placed to promote local

and national productivity coalitions, a commitment to liberal and reactive traditions ensured the state refused to ‘persuade, threat, or even coerce institutions into a co-operative bargain and to develop the machinery of co-ordination that consolidates such bargains.’[60]

From differing viewpoints the influence of rational choice theories has placed the establishment of weak bargaining environments at the heart of explanations of British postwar relative economic decline. Yet such an approach assumes government and business were at odds in a bargaining environment and misses entirely the very high degree of integration that clearly existed. Government’s perceived failure of industrial policy in postwar Britain is seen as an inability to achieve increasing growth rates through bargaining. Yet government was clearly aware of its importance for the continued profitability of private industry and was prepared to ensure that government policy was designed to defend the interests of private industry. In so doing it would not challenge the validity of private industry's view of what those 'interests' were. In essence then government readily accepted the need to defend exiting property rights and private industry's 'right to manage'.

An examination of the pharmaceutical industry highlights this point most clearly. The *Report of the Committee of Enquiry into the Cost of the National Health Service, 1956,* was established to find mechanisms to prevent the continued rise in the cost of health provision. While the report was critical that its investigation was 'hampered by a lack of information' from the pharmaceutical industry and that it could find 'no complete and satisfying explanation' for the rising cost of the drug bill it did in fact reach a number of conclusions.[61] The committee concluded that while the NHS 'was a very large buyer of these [pharmaceutical] products (in some instances virtually

the sole buyer) .. it is clearly right that the taxpayer should have a voice, through the Departments administering the Service, in the prices which are to be paid.' It was also accepted that 'account has to be taken of the present position and future development of the pharmaceutical industry in this country.'[62] Within a year, government and the pharmaceutical industry had established the Voluntary Price Regulation Scheme to regulate first manufacturers' proprietary products and later generic drug prices.[63] Importantly, then government perceived its role as consumer in two ways. First as regulator of oligopolistic profit maximising and second as a financier of last resort to strategic industries. Yet in its financing role it continued to take a passive stance.

More generally, both the Lemon and Lucas committees in the late 1940s had reported on government's importance to the electrical manufacturing and agricultural sectors. Monopolies and Restrictive Practice Commission reports throughout the 1950s emphasised the extent of collusion and price fixing among private firms and the detrimental affects this had on both private and public consumers. Not until the late 1950s can government be said to begin to utilise its importance as a consumer to actively promote rationalisation among specific industries, including the aircraft industry.[64] In the 1960s the National Economic Development Council and later the Industrial Reorganisation Corporation were established to further promote productivity growth and rationalisation by encouraging mergers and concentration within a wider range of industries, including cars and electrical engineering.

Government's failure it can be concluded lay not in an inadequate awareness of their relative position as the largest consumer of goods and services within the economy but in an unwillingness to utilise that position to the full and instead to readily accept the view of business where conflicts emerged.

An explanation of why government failed to undertake a more proactive industrial policy can be found in a more detailed examination of its contracting relationship with industry. Table 8 shows five firm employment concentration ratios for the industries reported in Table 6 for the year 1968. Estimates of average aggregate concentration ratios indicate five firm concentration accounted for almost 45% of employment in 1968.[65]

Table 8. Government Current Expenditure Purchases from Private Manufacturing Industry and five firm concentration ratios in 1968.

	% of domestic sales to government	5 firm concentration ratios [a]
Aircraft	93	72
Locomotives, railway equipment & other vehicles	60	83-96
Shipbuilding & marine engineering	49	52
Pharmaceuticals	58	39
Other mining and quarrying	52	70
Electronics and telecommunications	26	44-92
Mineral oil refining	18	44-88
Insulated wires & cables	28	82
Instrument engineering	18	23-81
Ordnance, small arms, general mechanical engineering & other mechanical engineering	17	29-80
Chemicals, lubricating oils, dyestuffs, explosives, polishes & allied industries	14	52-89
Engineers small tools	14	17
Household textiles and handkerchiefs	14	20
Other manufacturing	13	17-65
Wood & cork	13	38-41
Industrial engines	11	88
Domestic appliances	14	48
(Other electrical goods)	10	47
Electrical machinery	10	57
Soaps and detergents	12	69
Wire and wire manufacture	11	34

Note: [a] range refers to combinations of minimum list headings.

Sources: *Input-output 1968,* tabs. D & P, Hart and Clark, *Concentration*, tab. 2C.1

As can be seen from the table government orders were of greater importance for those industries which had higher than average concentration ratios. Industries which relied upon government for over a quarter or more of their domestic sales were likely to have a concentration ratio up to twice the average for all industry. Government contracting was thus typically with larger oligopolistic, if not monopolistic firms. One estimate suggests that large firms won 75 per cent of government orders.[66] Under these circumstances economic ideas of perfect competition involving atomistic firms as price-takers were irrelevant and pricing regulation, through voluntary agreements, such as the one operating for pharmaceuticals, or cost plus contracting, such as in defence and electrical engineering, emerged.[67] Here then lies the problem government faced in promoting efficiency and rationalisation. Government influence as a consumer to promote concentration and rationalisation was limited because its orders were focused on industries which were themselves already highly concentrated.

In other areas of industrial policy too the importance of big business and its linkages to government has been recognised. Mercer points out, large firms readily accepted and promoted a more stringent competition policy from 1956 onwards. Mercer emphasises the role played by large firms in the changing approach to competition policy. She suggests that 'business views reigned supreme' and government responded to rather than challenged these views. In particular it was transnational companies which sought a less restricted domestic market.[68] The importance of government orders for large private firms was that it was exactly these

orders which were unaffected by the introduction of competition policy. The reality of the contracting relationship was one of a government monopsonist facing oligopolistic (and even monopolistic) producers and it was suggested, with little exaggeration, 'Buggins turn' was used by manufacturers as a method of allocating public sector contracts.[69] Thus a small number of large firms negotiated with government, and each other, over orders which were, in the main, protected from international competition. This close relationship provided large firms with the flexibility to allow for an abandonment of collusive agreements. Simultaneously the increasing acceptance of GATT and consequent opening up of international markets ensured large firms were also able to enter into new international markets.

The results from the input-output data provide further evidence for this. Table 9 highlights the relationship between industries reliant upon government for domestic orders and those industries with high levels of exports as a proportion of total output.

Table 9. Government Current Expenditure Purchases from Private Manufacturing Industry and proportion of exports as a percentage of total output in 1968.

	% of domestic sales to government	Exports as a % of total output
Aircraft	93	35
Locomotives, railway equipment & other vehicles	60	26
Shipbuilding & marine engineering	49	26
Pharmaceuticals	58	33
Other mining and quarrying	52	16
Electronics and telecommunications	26	22
Mineral oil refining	18	20
Insulated wires & cables	28	16
Instrument engineering	18	31
Ordnance, small arms, general mechanical engineering & other mechanical engineering	17	18
Chemicals, lubricating oils, dyestuffs, explosives, polishes & allied industries	14	28

Engineers small tools	14	20
Household textiles and handkerchiefs	14	13
Other manufacturing	13	29
Wood & cork	13	8
Industrial engines	11	48
Domestic appliances	14	16
(Other electrical goods)	10	15
Electrical machinery	10	20
Soaps and detergents	12	13
Wire and wire manufacture	11	16

Sources: *Input-Output 1968*, tab D & P.

While exports accounted for 7% of total output in 1968 it is clear that in manufacturing sectors with a high proportion of domestic sales going to the public sector export markets were also more significant. Industries such as defence and pharmaceuticals were not unique in utilising large protected domestic orders to enhance their export competitiveness.

V

This article has presented a much more detailed quantitative picture of government's role within the private economy than has previously been available. It has been maintained that the influence of rational choice and bargaining environment theories within the current historiography is too simplistic, characterising government as open to institutional capture by rent-seeking private industry and/or incapable of developing the proactive policies required by a more developmental modernising state. Instead the article has argued that the state capitalist integration of the state (not simply government) and capital after 1945 was far more extensive than the bargaining approach recognises. As Harris notes of the period after 1945 'the boundaries between

public and private ... were becoming increasingly unclear. In the complexity of the inter-relationships, it was difficult to detect which was which, and not at all clear that detection served any useful purpose' and as Miliband similarly argues 'wherever the state "intervenes", there also, ... will businessmen be found to influence and even determine the nature of that intervention.'[70] This linkage has also been recognised outside of Marxist writing, with Grant suggesting that since the mid-1970s Britain has displayed the characteristics of a 'company state' in which a direct connection between government and industry has been the favoured option.[71]

In conclusion it is apparent that using input-output data we are able to develop a much more nuanced discussion of the development of relationships between the private and public sectors. Instead of developing a conflictual bargaining arrangement government and private industry consistently co-operated in the creation and re-creation of an economic environment conducive to large firms. Industrial policy was based upon the interests of large firms and particular sectors of the economy. Large firms benefited twice from the changes in postwar ideas on government's economic role. Not simply did they benefit from the growth of government as the economy's largest consumer but they also benefited from the growth of protected markets within a framework of reduced tariffs to international trade.

Appendix

The Theory of Input-Output Tables

This appendix provides a brief outline of methods used in creating tables 3, 4, 5 and 7.[72] The essential conceptual aspect of input-output tables is the recognition that all transactions represent a sale and a purchase, whose value is the same by either method of measuring.[73] Thus input-output tables use an industry x industry flow matrix to show the dis-aggregated value of purchases of intermediate goods and services between industries. Their initial development assumed a closed economy in which all goods and services were purchased and consumed within a given time span. In reality production is not a static process. Economies are not closed, goods and services are internationally traded, and output is not always used within a given time span; instead output can lead to increases in domestic fixed capital formation or increases in stocks and work in progress. As a result, input-output tables in practice measure the flow of intermediary products between industries. Final output is simply presented in aggregate form with the only distinction made between exports, final consumption (consumers and government), and output leading to increases in gross domestic capital formation (fixed and stocks). Most importantly then, input-output tables do not tell us which industries are making the capital investment nor what the inter-relationships are.

Tables 3, 4 and 5 were created by aggregating all purchases from the public sector and calculating these results as a proportion of total domestic output. Defining 'the public sector' is not, however, as straightforward as might be assumed. The coal, gas, water, and electricity supply industries are distinguished within the input-output tables for all three sets of tables.[74] The communications industry, principally the post office, is distinguished within the 1963 and 1968 tables. The road and railway industries present some problems. In the

1948 and 1968 tables they are treated separately but in the 1963 tables they are combined. In 1948 both industries were the subject of nationalisation but the road haulage industry was subsequently privatised in the 1950s. Therefore the 1963 combined category for road and rail transport includes a significant level of private industry. As a result the calculations for 1963 have been run both with and without the road and railway industry data. Excluding the road and rail transport category makes an impact in four areas: rubber purchases are reduced by 80 per cent, other vehicles (primarily locomotives) by 90 per cent, other electrical goods and mineral oils by 40 per cent each. Finally, the 1963 and 1968 tables also contains a separate category for 'other transport', which includes the public sector airlines, BEA and BOAC, and shipping expenditure in the British Rail accounts.[75] On the arbitrary basis that the public sector in this category may account for less half of the purchases made, and in order to create a downward bias in the results for later years, this category has been excluded. Including this category for 1963 would only make a significant impact on purchases from the mineral oil refining industry, which would be increased to 32 per cent. However, for 1968 purchases from the aerospace, shipbuilding and marine engineering, and finally coke ovens and manufactured fuel industries would all increase to 98 60, and 26 per cent respectively.

Unfortunately, imports of goods and services are treated differently in the 1948 tables compared to 1963 and 1968. In the 1948 tables competitive imports were presented separately from the sector producing the respective commodity, whereas they were allocated directly into the industry's sales for the 1963 and 1968 tables. Table A1 & A2 demonstrates the differing ways in which imports were included

Table A1 Input-Output Table for 1948[a]

	Intermediate output £m	Final Goods £m		Fixed capital formation £m	Imports £m	Exports £m	Total Output £m
		Public	Private				
Commodity Input groups 1-47	9,566	2,403	6,885	1,730	-1,415	1,973	21,141
Total Goods & Services [b]	18,879	3,241	8,377	1,730	-1,415	1,973	32,783

Notes: [a] totals may not add due to rounding: [b] Totals goods and services includes wages and salaries, gross surplus , and taxes on expenditure less subsidies

Sources: Stewart, 'Input-Output', p.viii

Table A2 Input-Output Table for 1968 [a]

	Intermediate output £m	Final Goods £m		Fixed capital formation £m	Exports £m	Total Output £M
		Public (- imports)	Private			
Commodity Input groups 1-90	20,748	4,949	18,645	7,736	8,211	60,287
Imports	5,662	566	1,793	679	471	9,171
Total Goods & Services [b]	61,969	12,463	27,245	8,231	8,799	118,706

Notes: [a] totals may not add due to rounding: [b] Totals goods and services includes public administration, domestic services and ownership of dwellings, wages and salaries, gross profits, income from employment and taxes on expenditure less subsidies

Sources: *Input-output 1968,* tabs. D & P.

The differing treatment of imports means that total industry output for 1948 refers to domestic industry's output only whereas for 1963 and 1968 each industry's output is inflated by the inclusion of imported goods. Second, purchases from each industry in 1948 do not distinguish between government purchases from domestic producers and purchases of imported goods, whereas the 1963 and 1968 tables make these distinctions.[76] It is not possible to standardise imports between these two accounting approaches. The result of this difference in the treatment of imports is that in 1948 government purchases are increased as a proportion of total output while for 1963 and 1968 government purchases are reduced as a proportion of total output. This is not, however, considered to be of significance for two reasons. Imports in 1948 were still highly constrained by dollar shortages and government controls. Second any upward bias in the 1948 results or downward bias in the 1963 and 1968 results acts against the point this study is trying to make, namely, that the public sector was of increasing importance as a factor in sales for private firms.

To examine increases in capital formation table 7 relies upon the broader categorisation of capital investment made within *National Income and Expenditure Tables*, between vehicles, ships and aircraft, plant and machinery, and construction (dwellings and other new buildings and works combined).

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[2] Deane, *First industrial* pp.219-37: O'Brien, 'Central government', pp.205-41.

[3] Barnett, *Audit*: Hutton, *State:* Broadberry & Crafts, 'Economic policy'*:* Middleton, *Government*: Phelps-Brown, 'British predicament': Cairncross, *'Recovery'* Tomlinson, *Public policy*.

[4] Skidelsky, 'Public finance', pp.59-66: Hall, *Governing*: Schonfield, *Modern capitalism*.

[5] Artis, *UK economy*, pp.112-21: Feinstein, *National income*, tabs. 5 and 14: Gemmell, *Growth*.

[6] Nusbaumer writing on the service sector has even suggested that 'Almost everything which economists have written to this day on services is based upon on incomplete and even incoherent statistics and on inappropriate methods of analysis.' Nusbaumer, *Services economy*, pp.47 & 60.

[7] Hatton and Chrystal, 'The budget', p. 55: Artis, *UK economy*, p.115.

[8] Heald, *Public expenditure*, pp. 23-4.

[9] *National income, (1959),* tabs 40-1.

[10] *Ibid*, p.75

[11] Derived from *Ibid*, tabs. 41-2.

[12] *National income, 1966*, p.118.

[13] *Ibid*, tab. 41.

[14] M.A.F., *Agricultural marketing*, para. 231-3: Cairncross, 'Reconversion', p.47.

[15] PRO MAF 333/3, Memorandum on Agricultural Protection 21 Jan.1959 and, Aug. 1961.

[16] *National income, 1959*, tabs. 41-2.

[17] Skidelsky, 'Foreword', p.xvi.

[18] Middleton, *Government*, tab. 12.15.

[19] Edgerton, *Science, technology*, pp.37-47: Middleton, *Government*, pp.614-7.

[20] EIU, *Economic effects*, p.49.

[21] *Ibid.*, p.65.

[22] *Ibid*., p.82.

[23] Edgerton, 'Public ownership', p.184.

[24] Idem., 'Liberal militarism'.

[25] Jeremy, 'Hundred largest employers' quoted in Edgerton, 'Public ownership', p.182.

[26] Kidron, *Western capitalism*, pp.48-64: Binns, 'New cold war'.

[27] Freeman, 'Government policy', pp.310-35.

[28] Leontief, *Input-output*, p.134: Gossling, *Input-output*.

[29] Millar and Blair, *Input-output'*, pp.149-99.

[30] Barna, *Structural interdependence*. pp.1-7: Sarma and Tulasidahar, *Economic impact*, pp7-19.

[31] There is also an independently produced set of tables for 1935 and officially produced partial tabs were for 1950. Barna, 'Interdependence', pp.29-81: *Input-output 1968*, p.3.

[32] For a non-technical description of input-output table construction see Appendix.

[33] The input-output tables for 1954, classified the purchases of intermediate goods and services under 45 industry headings. Unfortunately, the 1954 tables only dis-aggregate public authorities (national and local government) expenditure into eleven categories, making them of little use for this study. Stewart, 'Input-output', pp.vii-ix: *Input-output, 1963*, tab. A: *Input-output 1968*, p.3 and *Input-output 1954*, tab. 1, pp.4-5

[34] These are abridged versions of the full input-output tables. Full tables are available from the author on request.

[35] M.S., *Standardisation*, p.24.

[36] Richardson, *Future*.

[37] *C.E. Cost of the NHS*, (P.P. 1956), para.492: Reekie, *Prescribing*, p.8.

[38] Sciberras, 'UK semiconductor industry', p.289.

[39] Hays, *National income*, p.63

[40] Heald, *Public expenditure*, p. 91.

[41] Bacon & Eltis, *Economic problem*, pp.92-116.

[42] *Ibid.*, p.27.

[43] *Ibid.*, p.93.

[44] Gemmell, *Growth*: Mullard, *Politics.*

[45] Heald, p.96

[46] Skidelsky, *Keynes*, pp.70-7.

[47] Cairncross, *British economy*, pp.303.

[48] Matthews, 'Full employment', pp. 555-69.

[49] Bean and Crafts, 'Economic growth', pp.140-2

[50] Broadberry & Crafts, 'Economic policy', p.80.

[51] Crafts, *De-industrialisation*, p.49.

[52] Eichengreen, 'Explaining', p.217.

[53] Olson, *Rise and decline*: Broadberry and Crafts, *Economic policy*, p.86.

[54] Bean and Crafts, 'Economic growth', p.142: Stiglitz, *Economic role*, p.58.

[55] Gourvish, 'Rise (and fall)', p.114.

[56] Foreman-Peck & Millward, *Public and private*, p.299.

[57] Hall, *Governing*, p.230: Schonfield, *Modern capitalism:* Tiratsoo and Tomlinson, *Industrial efficiency*, pp.13-20, 153-70.

[58] Chick, 'Private', p.88.

[59] Booth, Melling & Dartmann, 'Institutions', pp.416-44.

[60] Ibid., p.436.

[61] *C.E. Cost of the NHS*,, para.42.

[62] *Ibid*, para.493.

[63] Reekie, *Prescribing*, p.42

[64] Wilson, *British business*, p.200.

[65] Hart and Clark, *Concentration*, tab. 2.5

[66] Grant, *Business and politics*., p.63.

[67] Wiliams, et. al., *Manufacturing*, p.174.

[68] Mercer, *Constructing*, p.170-3.

[69] Posner, 'Industrial policies', p.164.

[70] Harris, *Competition*, p.65: Miliband, *State*, p.58.

[71] Grant, *Business and politics*, pp.63-5

[72] For a fuller introduction into input-output techniques see Van Arckadie and Frank, *Economic accounting*.

[73] Key weaknesses of input-output tables included the assumptions of constant returns to scale, a lack of technical progress and industry output as homogenous. Fortunately none of these issues prevent the use of the tables for this study.

[74] Although the second reading of the gas nationalisation bill was in 1948 the vesting date for nationalisation was not until 1st April 1949. Nevertheless, it is included here as part of the public sector.

[75] *Input-output 1963*, p.18

[76] Stewart, 'Input-Output', p.viii: *Input-output, 1963*, p.4.